

=> file reg

FILE 'REGISTRY' ENTERED AT 13:03:50 ON 31 JUL 2002  
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STRUCTURE FILE UPDATES: 30 JUL 2002 HIGHEST RN 441272-85-1  
DICTIONARY FILE UPDATES: 30 JUL 2002 HIGHEST RN 441272-85-1

TSCA INFORMATION NOW CURRENT THROUGH January 7, 2002

Please note that search-term pricing does apply when  
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Calculated physical property data is now available. See HELP PROPERTIES  
for more information. See STNote 27, Searching Properties in the CAS  
Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

=> d his

(FILE 'HCAPLUS' ENTERED AT 10:20:44 ON 31 JUL 2002)

DEL HIS Y  
L1 9449 S IWAMOTO ?/AU  
L2 217 S KOSHINA ?/AU  
L3 3291 S SHIMAMURA ?/AU  
L4 4858 S NITTA ?/AU  
L5 1 S L1 AND L2 AND L3 AND L4  
SEL L5 1 RN

FILE 'REGISTRY' ENTERED AT 10:23:25 ON 31 JUL 2002

L6 10 S E1-E10  
E LITHIUM/CN  
L7 1 S E3  
E SILICON/CN  
L8 1 S E3  
E TIN/CN  
L9 1 S E3  
E ZINC/CN  
L10 1 S E3

FILE 'HCAPLUS' ENTERED AT 10:40:57 ON 31 JUL 2002

L11 176635 S BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY? OR  
L12 388472 S ELECTROLY?  
L13 38195 S NONAQUEOUS? OR NONAQ# OR NON(2A) (AQ# OR AQUEOUS?)  
L14 QUE L7 OR LITHIUM# OR LITHIAT? OR LI  
L15 326682 S L8  
L16 63798 S L9  
L17 209994 S L10  
L18 168843 S SOLIDSOLUTION? OR SOLIDSOLN# OR SOLID?(2A) (SOLN# OR SOL

L19 46257 S INTERMETAL? OR INTER(A)METAL?  
E ALKALINE EARTH METALS/CV  
L20 7599 S E3  
E GROUP IIB ELEMENTS/CV  
L21 765 S E3  
E GROUP IIIA ELEMENTS/CV  
L22 1828 S E3  
E GROUP IVA ELEMENTS/CV  
L23 1694 S E3

FILE 'LCA' ENTERED AT 10:47:21 ON 31 JUL 2002

FILE 'HCAPLUS' ENTERED AT 10:53:49 ON 31 JUL 2002

L24 33299 S INTERCALAT?  
L25 1255 S DEINTERCALAT? OR DE(A)INTERCALAT?

FILE 'LCA' ENTERED AT 10:53:50 ON 31 JUL 2002

L26 204 S ENCAPSUL? OR CAPSUL?  
L27 7645 S (FILM? OR THINFILM? OR LAYER? OR OVERLAY? OR OVERLAID?  
L28 5586 S (PARTICL? OR MICROPARTICL? OR PARTICULAT? OR DUST? OR G  
L29 5560 S PARTICL? OR MICROPARTICL? OR PARTICULAT? OR DUST? OR GR

FILE 'HCAPLUS' ENTERED AT 10:58:36 ON 31 JUL 2002

L30 113896 S (ENCOAT? OR L26 OR L27) (2A)L29  
L31 5907 S L11 AND L12 AND L13 AND L14  
L32 111 S L31 AND L30  
L33 9 S L32 AND (L15 OR L16 OR L17)  
L34 5 S L32 AND (L18 OR L19)  
L35 0 S L32 AND (L20-L23)  
L36 32 S L32 AND (L24 OR L25)  
L37 1 S L32 AND L24 AND L25  
L38 178 S L31 AND (L15 OR L16 OR L17)  
L39 19 S L38 AND (L18 OR L19)  
L40 3 S L39 AND (L20-L23)  
L41 8 S L38 AND (L20-L23)  
L42 56 S L38 AND (L24 OR L25)  
L43 2 S L38 AND L24 AND L25  
L44 6 S L42 AND L39  
L45 8 S L31 AND (L15 OR L16 OR L17) AND (L20-L23)

FILE 'REGISTRY' ENTERED AT 11:11:25 ON 31 JUL 2002

ACT EOEGPOPG/A

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L46 ( 9682)SEA FILE=REGISTRY 75-21-8/CRN  
L47 ( 21863)SEA FILE=REGISTRY 107-21-1/CRN  
L48 ( 9283)SEA FILE=REGISTRY 75-56-9/CRN  
L49 ( 8413)SEA FILE=REGISTRY 57-55-6/CRN  
L50 ( 7690)SEA FILE=REGISTRY (L46 OR L47) AND (L48 OR L49)  
L51 11 SEA FILE=REGISTRY L50 AND 2/NC  
-----

E POLYACRYLONITRILE/CN  
L52 1 S E3

E POLYVINYLIDENE FLUORIDE/CN  
E VINYLIDENE FLUORIDE, HOMOPOLYMER/CN  
E VINYLIDENE FLUORIDE POLYMER/CN  
L53 1 S E3  
E POLYHEXAFLUOROPROPYLENE/CN  
E HEXAFLUOROPROPYLENE POLYMER/CN  
L54 1 S E3  
E POLYTETRAFLUOROETHYLENE/CN  
L55 1 S E3  
E TRIFLUOROMETHYL VINYL ETHER POLYMER/CN  
L56 1 S E2  
L57 17 S 1645-89-2/CRN  
L58 1 S L57 AND 1/NC  
L59 5 S L52 OR L53 OR L54 OR L55 OR L58

FILE 'HCAPLUS' ENTERED AT 11:30:50 ON 31 JUL 2002

L60 54091 S L59  
L61 14255 S L51  
L62 21 S L38 AND (L60 OR L61)  
L63 0 S L38 AND (POLYESTER# OR POLY(2A)ESTER#)  
L64 QUE GEL OR GELS OR GELLED OR GELLING# OR GELATION?  
L65 1 S L62 AND L64  
L66 1 S L62 AND (L18 OR L19)  
L67 1 S L62 AND (L20-L23)  
L68 8 S L62 AND (L24 OR L25)  
L69 0 S L62 AND L30  
L70 3 S L65 OR L66 OR L67  
L71 6 S L68 NOT L70  
L72 12 S L62 NOT (L70 OR L71)  
L73 11 S L34 OR L37 OR L40 OR L43  
L74 16 S (L33 OR L41 OR L44 OR L45) NOT L73

FILE 'LCA' ENTERED AT 11:44:51 ON 31 JUL 2002

FILE 'HCAPLUS' ENTERED AT 11:46:37 ON 31 JUL 2002

L75 32404 S (COMPOSITE# OR CORE# OR CORING# OR CENTER? OR CENTRAL?)  
L76 86 S (L11 OR L12 OR L13 OR L14) AND (L15 OR L16 OR L17) AND  
L77 5 S L76 AND (L20-L23)  
L78 19 S L76 AND (L18 OR L19)  
L79 7 S L76 AND (L24 OR L25)  
L80 26 S L76 AND L30  
L81 3 S L78 AND L80  
L82 9 S (L77 OR L79 OR L81) NOT L73  
L83 20 S L77 OR L79 OR L81 OR L73  
L84 13 S L74 NOT L83

FILE 'REGISTRY' ENTERED AT 13:02:48 ON 31 JUL 2002

FILE 'HCA' ENTERED AT 13:03:10 ON 31 JUL 2002

FILE 'REGISTRY' ENTERED AT 13:03:50 ON 31 JUL 2002

=> file hcaplus

FILE 'HCAPLUS' ENTERED AT 13:03:58 ON 31 JUL 2002

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FILE COVERS 1907 - 31 Jul 2002 VOL 137 ISS 5

FILE LAST UPDATED: 30 Jul 2002 (20020730/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

CAS roles have been modified effective December 16, 2001. Please check your SDI profiles to see if they need to be revised. For information on CAS roles, enter HELP ROLES at an arrow prompt or use the CAS Roles thesaurus (/RL field) in this file.

=> d l70 1-3 ibib abs hitstr hitind

L70 ANSWER 1 OF 3 HCAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2000:757024 HCAPLUS

DOCUMENT NUMBER: 133:337711

TITLE: **Nonaqueous electrolyte  
secondary cell**

INVENTOR(S): Shimamura, Harunari; Nitta, Yoshiaki

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: PCT Int. Appl., 29 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
WO 2000063986	A1	20001026	WO 2000-JP2502	20000418
W: US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 2001006677	A2	20010112	JP 2000-114799	20000417
JP 2001006667	A2	20010112	JP 2000-114800	20000417

EP 1109239 A1 20010620 EP 2000-917330 20000418

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, FI

PRIORITY APPLN. INFO.:

JP 1999-112073 A 19990420

JP 1999-112074 A 19990420

WO 2000-JP2502 W 20000418

AB A nonaq. electrolyte secondary

cell comprises a neg. electrode which comprises, as its main material, composite particles having nuclear particles comprising at least one constituent element selected from tin, silicon and zinc and, covering at least a part of the circumference thereof, a solid soln. or an intermetallic compd.

of the constituent element with at least one element selected from the group consisting of 2 Group elements exclusive of the constituent elements of nuclear particles, transition elements, Group 12 elements, Group 13 elements and Group 14 elements exclusive of carbon of the Periodic Table, and in that the lithium occluded in the composite particles has a NMR signal in the range of -10 to 40 ppm and also at least one other signal in the range of -10 to 4 ppm. The nonaq. electrolyte

secondary cell has higher energy d. and improved in life characteristics in charge-discharge cycle, as compared to a conventional cell using a carbon material for a neg. electrode.

IT 7440-21-3, Silicon, uses 7440-31-5, Tin, uses

7440-66-6, Zinc, uses

(neg. electrode in nonaq. electrolyte  
secondary cell contg.)

RN 7440-21-3 HCAPLUS

CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 7440-31-5 HCAPLUS

CN Tin (8CI, 9CI) (CA INDEX NAME)

Sn

RN 7440-66-6 HCAPLUS

CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT 24937-79-9, PVDF

(pos. electrode in nonaq. electrolyte  
secondary cell contg.)

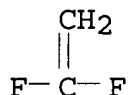
RN 24937-79-9 HCAPLUS

CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 75-38-7

CMF C2 H2 F2



IC ICM H01M004-38

ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **nonaq electrolyte secondary cell**

IT Secondary **batteries**  
(**nonaq. electrolyte; nonaq. electrolyte secondary cell**)

IT Fluoropolymers, uses  
(pos. electrode in **nonaq. electrolyte secondary cell** contg.)

IT 1313-08-2 7440-21-3, Silicon, uses 7440-31-5,  
Tin, uses 7440-66-6, Zinc, uses 11099-22-2 11109-57-2  
11110-87-5 11124-13-3 11125-88-5 11143-56-9 11149-84-1  
12017-12-8, Cobalt silicide CoSi2 12023-01-7 12057-70-4  
12201-89-7, Nickel silicide NiSi2 22831-39-6, Magnesium silicide  
Mg2Si 37230-21-0 51844-78-1 74946-92-2 96755-45-2  
144692-49-9 303985-97-9  
(neg. electrode in **nonaq. electrolyte secondary cell** contg.)

IT 7440-44-0, Carbon, uses 12190-79-3, **Lithium cobalt oxide**  
**LiCoO2** 24937-79-9, PVDF  
(pos. electrode in **nonaq. electrolyte secondary cell** contg.)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L70 ANSWER 2 OF 3 HCAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2000:49109 HCAPLUS

DOCUMENT NUMBER: 132:110582

TITLE: **Nonaqueous secondary batteries**

INVENTOR(S): Tomiyama; Hideki

PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

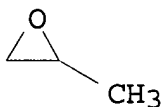
FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2000021449	A2	20000121	JP 1998-186328	19980701
AB	The <b>batteries</b> comprise a <b>Li</b> -contg. transition metal oxide cathode, a <b>Li</b> -intercalating Si-contg. anode, and a <b>electrolyte gel</b> contg. (a) org. polymer, (b) non-protonic solvent, and (c) ammonium, alkali metal, or alk. earth metal salt. The <b>batteries</b> have excellent charge-discharge cycle characteristics.				
IT	7440-21-3, Silicon, uses (anode; <b>lithium</b> secondary <b>batteries</b> with polymer <b>gel electrolytes</b> )				
RN	7440-21-3 HCAPLUS				
CN	Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)				

Si

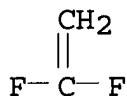
IT	9003-11-6, Ethylene oxide-propylene oxide copolymer 24937-79-9, Poly(vinylidene fluoride) 25014-41-9, Polyacrylonitrile ( <b>lithium</b> secondary <b>batteries</b> with polymer <b>gel electrolytes</b> )				
RN	9003-11-6 HCAPLUS				
CN	Oxirane, methyl-, polymer with oxirane (9CI) (CA INDEX NAME)				
CM	1				
CRN	75-56-9				
CMF	C3 H6 O				



CM	2				
CRN	75-21-8				
CMF	C2 H4 O				



RN 24937-79-9 HCAPLUS  
 CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 75-38-7  
 CMF C2 H2 F2



RN 25014-41-9 HCAPLUS  
 CN 2-Propenenitrile, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 107-13-1  
 CMF C3 H3 N



IC ICM H01M010-40  
 ICS H01M010-40; H01M004-02; H01M004-58  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 ST **nonaq secondary battery gel electrolyte; oxyalkylene vinyl polymer gel electrolyte battery**  
 IT **Gels**  
     **(electrolyte; lithium secondary batteries with polymer gel electrolytes)**  
 IT **Battery electrolytes**  
     **Polymer electrolytes**  
     **Secondary batteries**  
       **(lithium secondary batteries with polymer gel electrolytes)**  
 IT Fluoropolymers, uses  
     Polyoxyalkylenes, uses  
       **(lithium secondary batteries with polymer gel electrolytes)**  
 IT Polyphosphazenes  
     Polyphosphazenes  
     Polysiloxanes, uses  
     Polysiloxanes, uses  
       **(polyoxyalkylene-, graft, lithium complex; lithium secondary batteries with polymer**



- gel electrolytes)**
- IT Polyoxyalkylenes, uses  
Polyoxyalkylenes, uses  
(polyphosphazene-, graft, **lithium** complex;  
**lithium** secondary **batteries** with polymer  
**gel electrolytes)**
- IT Polyoxyalkylenes, uses  
Polyoxyalkylenes, uses  
(polysiloxane-, graft, **lithium** complex; **lithium**  
secondary **batteries** with polymer **gel**  
**electrolytes)**
- IT 7440-02-0, Nickel, uses  
(-coated silicon anode; **lithium** secondary  
**batteries** with polymer **gel electrolytes**  
)
- IT 7440-21-3, Silicon, uses 7631-86-9, Silica, uses  
193072-79-6  
(anode; **lithium** secondary **batteries** with  
polymer **gel electrolytes)**
- IT 12190-79-3, Cobalt **lithium** oxide (CoLiO<sub>2</sub>)  
(cathode; **lithium** secondary **batteries** with  
polymer **gel electrolytes)**
- IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate  
(**electrolyte** solvent; **lithium** secondary  
**batteries** with polymer **gel electrolytes**  
)
- IT 21324-40-3, **Lithium** hexafluorophosphate  
(**electrolyte**; **lithium** secondary  
**batteries** with polymer **gel electrolytes**  
)
- IT 9003-11-6, Ethylene oxide-propylene oxide copolymer  
9011-17-0 24937-79-9, Poly(vinylidene fluoride)  
24968-79-4, Acrylonitrile-methyl acrylate copolymer  
25014-41-9, Polyacrylonitrile 25067-61-2,  
Polymethacrylonitrile 25322-68-3 25322-69-4 29613-70-5  
50867-60-2, Acrylonitrile-methyl vinyl ether copolymer 98973-15-0  
115401-75-7 255897-37-1 255897-39-3 255897-40-6 255897-42-8  
255897-44-0 255897-45-1 255897-46-2 255897-47-3 255897-48-4  
(**lithium** secondary **batteries** with polymer  
**gel electrolytes)**

L70 ANSWER 3 OF 3 HCAPLUS COPYRIGHT 2002 ACS  
 ACCESSION NUMBER: 1999:814058 HCAPLUS  
 DOCUMENT NUMBER: 132:52390  
 TITLE: **Nonaqueous electrolyte**  
 secondary **batteries** with improved  
 electrodes  
 INVENTOR(S): Miyasaka, Isao  
 PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 17 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

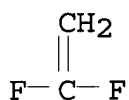
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 11354118	A2	19991224	JP 1998-159336	19980608
AB	The title <b>battery</b> uses anodes from <b>Li</b> -intercalatable Si-contg. compds., and cathodes from .alpha.-NaFeO <sub>2</sub> -or spinel-type <b>Li</b> mixed oxides, which contain (1) Co, Ni, Mn, and/or Fe, (2) .ltoreq.0.1 wt.% alk. earth metal, and (3) .ltoreq.0.1 wt.% S.				
IT	7440-66-6, Zinc, uses 24937-79-9, Poly(vinylidene fluoride) (coatings; secondary <b>Li battery</b> using anodes from Si compd. and cathodes from <b>Li</b> mixed oxide)				
RN	7440-66-6 HCAPLUS				
CN	Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)				

Zn

RN 24937-79-9 HCAPLUS  
 CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 75-38-7  
 CMF C2 H2 F2



IT 7440-21-3, Silicon, uses (secondary **Li battery** using anodes from Si compd. and cathodes from **Li** mixed oxide)

RN 7440-21-3 HCAPLUS

CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IC ICM H01M004-58  
 ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** anode silicon **lithium** intercalation;  
 cathode **battery lithium** oxide

IT Fluoropolymers, uses  
 (coatings; secondary **Li battery** using anodes  
 from Si compd. and cathodes from **Li** mixed oxide)

IT **Battery** anodes  
**Battery** cathodes  
 Secondary **batteries**  
 (secondary **Li battery** using anodes from Si  
 compd. and cathodes from **Li** mixed oxide)

IT **Alkaline earth metals**  
 (secondary **Li battery** using anodes from Si  
 compd. and cathodes from **Li** mixed oxide)

IT 7440-02-0, Nickel, uses 7440-22-4, Silver, uses 7440-66-6  
 , Zinc, uses 24937-79-9, Poly(vinylidene fluoride)  
 (coatings; secondary **Li battery** using anodes  
 from Si compd. and cathodes from **Li** mixed oxide)

IT 7440-21-3, Silicon, uses 7631-86-9, Silica, uses  
 11133-86-1 11148-22-4 12719-63-0 51969-29-0 96755-45-2  
 113066-89-0, Cobalt **lithium** nickel oxide (Co<sub>0.2</sub>LiNi<sub>0.8</sub>O<sub>2</sub>)  
 216385-53-4 252905-19-4, Cobalt **lithium** nickel borate  
 oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>(BO<sub>3</sub>)<sub>0.05</sub>O<sub>1.95</sub>) 252905-25-2, Cobalt  
**lithium** manganese oxide (Co<sub>0.05</sub>Li<sub>1.05</sub>Mn<sub>1.95</sub>O<sub>4.05</sub>)  
 252905-30-9, Cobalt **lithium** manganese oxide  
 (Co<sub>0.05</sub>Li<sub>1.05</sub>Mn<sub>1.95</sub>O<sub>3.95</sub>) 252905-33-2 252905-35-4 252905-37-6  
 252905-41-2  
 (secondary **Li battery** using anodes from Si  
 compd. and cathodes from **Li** mixed oxide)

IT 7704-34-9, Sulfur, processes  
 (secondary **Li battery** using anodes from Si  
 compd. and cathodes from **Li** mixed oxide)

=> d 171 1-6 ibib abs hitstr hitind

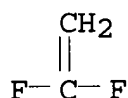
L71 ANSWER 1 OF 6 HCAPLUS COPYRIGHT 2002 ACS  
 ACCESSION NUMBER: 2002:486325 HCAPLUS  
 DOCUMENT NUMBER: 137:35551  
 TITLE: **Nonaqueous electrolyte**  
 secondary **battery** with improved safety  
 INVENTOR(S): Saisho, Keiji; Watanabe, Hiroshi; Nakane, Ikuro;  
 Narukawa, Satoshi; Tsujioka, Norio  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
 SOURCE: Eur. Pat. Appl., 25 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1217671	A2	20020626	EP 2001-130748	20011221
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,				

PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR  
 JP 2002190294 A2 20020705 JP 2000-389685 20001222  
 PRIORITY APPLN. INFO.: JP 2000-389685 A 20001222

AB In a **nonaq. secondary cell** having a  
 pos. electrode, a neg. electrode, a **nonaq.  
 electrolyte**, a separator interposed between the pos.  
 electrode and the neg. electrode, the pos. electrode having a pos.  
 electrode active material including a chem. compd. capable of  
 reversibly **intercalating lithium** and the neg.  
 electrode having a neg. electrode active material including a  
 material capable of reversibly **intercalating  
 lithium**, the separator has through holes formed therein for  
 passing **lithium** dendrites there-through.  
 IT 7440-21-3, Silicon, uses 24937-79-9, PvdF  
 (**nonaq. electrolyte secondary battery**  
 with improved safety)  
 RN 7440-21-3 HCAPLUS  
 CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si  
 RN 24937-79-9 HCAPLUS  
 CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 75-38-7  
 CMF C2 H2 F2



IC ICM H01M002-18  
 ICS H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST **battery nonaq secondary improved safety; safety  
 improvement battery nonaq secondary**  
 IT **Secondary batteries**  
 (**lithium; nonaq. electrolyte**  
**secondary battery with improved safety**)  
 IT **Safety**  
**Secondary battery separators**  
 (**nonaq. electrolyte secondary battery**  
 with improved safety)  
 IT **Fluoropolymers, uses**  
**Polyoxyalkylenes, uses**  
 (**nonaq. electrolyte secondary battery**)

with improved safety)  
 IT 1332-29-2, Tin oxide 7440-21-3, Silicon, uses 7782-42-5,  
 Graphite, uses 9011-14-7, Pmma 24937-79-9, Pvd  
 25322-68-3, Peo  
 (nonaq. electrolyte secondary battery  
 with improved safety)

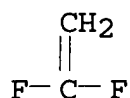
L71 ANSWER 2 OF 6 HCAPLUS COPYRIGHT 2002 ACS  
 ACCESSION NUMBER: 2001:366646 HCAPLUS  
 DOCUMENT NUMBER: 134:342560  
 TITLE: **Nonaqueous secondary battery**  
 containing silicic material  
 INVENTOR(S): Idota, Yoshio; Matsufuji, Akihiro; Mori,  
 Nobufumi; Kase, Akira; Kagawa, Yoshikatsu;  
 Miyamoto, Hajime  
 PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan  
 SOURCE: U.S., 19 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6235427	B1	20010522	US 1999-309309	19990511
JP 2000003727	A2	20000107	JP 1998-165501	19980612
JP 2000036323	A2	20000202	JP 1998-167446	19980615
JP 2000012018	A2	20000114	JP 1998-171665	19980618
PRIORITY APPLN. INFO.:			JP 1998-130836	A 19980513
			JP 1998-165501	A 19980612
			JP 1998-167446	A 19980615
			JP 1998-171665	A 19980618

AB A **nonaq.** secondary battery is disclosed,  
 comprising a pos. electrode having a pos. electrode active material,  
 a neg. electrode having a neg. electrode material, and a  
**nonaq. electrolyte**, wherein the pos. electrode  
 active material is a transition metal oxide capable of  
**intercalating and deintercalating lithium**  
 , and the neg. electrode material comprises at least one silicic  
 material capable of **intercalating and**  
**deintercalating lithium selected from silicon, a**  
**silicon alloy and a silicide, and a process for producing the**  
**nonaq. secondary battery** is disclosed.

IT 24937-79-9, Poly(vinylidene fluoride)  
 (binder; **nonaq.** secondary battery contg.  
 silicic material)  
 RN 24937-79-9 HCAPLUS  
 CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)

CRN 75-38-7  
CMF C2 H2 F2



IT 7440-66-6, Zinc, uses  
(coating; **nonaq.** secondary **battery** contg.  
silicic material)  
RN 7440-66-6 HCAPLUS  
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT 7439-93-2, Lithium, uses  
(**nonaq.** secondary **battery** contg. silicic  
material)  
RN 7439-93-2 HCAPLUS  
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7440-21-3, Silicon, uses  
(**nonaq.** secondary **battery** contg. silicic  
material)  
RN 7440-21-3 HCAPLUS  
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IC ICM H01M004-58  
NCL 429218100  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST **battery** anode silicic material  
IT Fluoropolymers, uses  
(binder; **nonaq.** secondary **battery** contg.  
silicic material)  
IT Ceramics  
(coating; **nonaq.** secondary **battery** contg.  
silicic material)  
IT Metals, uses  
(coating; **nonaq.** secondary **battery** contg.  
silicic material)

IT **Intercalation**  
 (electrochem.; **nonaq.** secondary **battery**  
 contg. silicic material)

IT **Secondary batteries**  
 (**lithium**; **nonaq.** secondary **battery**  
 contg. silicic material)

IT **Battery anodes**  
 (**nonaq.** secondary **battery** contg. silicic  
 material)

IT Carbon black, uses  
 (**nonaq.** secondary **battery** contg. silicic  
 material)

IT Plastics, uses  
 (thermoplastics, coating; **nonaq.** secondary  
**battery** contg. silicic material)

IT Silicon alloy, base  
 (**nonaq.** secondary **battery** contg. silicic  
 material)

IT 24937-79-9, Poly(vinylidene fluoride)  
 (binder; **nonaq.** secondary **battery** contg.  
 silicic material)

IT 7440-02-0, Nickel, uses 7440-22-4, Silver, uses 7440-66-6  
 , Zinc, uses  
 (coating; **nonaq.** secondary **battery** contg.  
 silicic material)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 1344-28-1, Alumina, uses 7440-44-0, Carbon, uses 7631-86-9,  
 Silica, uses 12190-79-3, Cobalt **lithium** oxide colio2  
 12675-05-7 14283-07-9, **Lithium** tetrafluoroborate  
 21324-40-3, **Lithium** hexafluorophosphate 116226-26-7  
 120440-46-2 145634-33-9 174180-05-3, Cobalt **lithium**  
 oxide CoLi0-1.2O2 174180-06-4, **Lithium** nickel oxide  
 Li0-1.2NiO2 214636-25-6 214636-26-7 253432-73-4 253432-74-5  
 253432-75-6 253432-76-7 296800-04-9, **Lithium** manganese  
 oxide Li0-1.2MnO2 338459-39-5, Iron **lithium** oxide  
 (FeLi0-1.2O2) 338459-40-8 338459-41-9 338459-42-0  
 338459-43-1 338459-44-2 338459-45-3 338459-46-4 338459-47-5  
 (**nonaq.** secondary **battery** contg. silicic  
 material)

IT 68848-64-6  
 (**nonaq.** secondary **battery** contg. silicic  
 material)

IT 7439-93-2, **Lithium**, uses  
 (**nonaq.** secondary **battery** contg. silicic  
 material)

IT 7782-42-5, Graphite, uses  
 (**nonaq.** secondary **battery** contg. silicic  
 material)

IT 7440-21-3, Silicon, uses  
 (**nonaq.** secondary **battery** contg. silicic  
 material)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR

THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L71 ANSWER 3 OF 6 HCAPLUS COPYRIGHT 2002 ACS  
 ACCESSION NUMBER: 2000:513424 HCAPLUS  
 DOCUMENT NUMBER: 133:107439  
 TITLE: Spinel type oxide cathode for **nonaqueous electrolyte battery** with **lithium intercalating** anode  
 INVENTOR(S): Narukawa, Satoshi; Imachi, Naoko; Nakamizo, Shiori  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
 SOURCE: Eur. Pat. Appl., 28 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1022792	A1	20000726	EP 2000-101444	20000125
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2000215884	A2	20000804	JP 1999-16141	19990125
TW 431012	B	20010421	TW 1999-88120664	19991126
KR 2000052412	A	20000825	KR 1999-54801	19991203
CN 1262532	A	20000809	CN 1999-126373	19991217

PRIORITY APPLN. INFO.: JP 1999-16141 A 19990125

AB A cathode for a **nonaq. electrolyte cell** is comprised of a mixt. of spinel-type **lithium** manganese oxide represented by a formula  $\text{Li}_{1+x}\text{Mn}_{2-y}\text{O}_4$  (provided that the at. ratio of **lithium** and manganese is detd. to be 0.56 .ltoreq.  $\text{Li}/\text{Mn} [(1+x)/(2-y)]$  .ltoreq. 0.62, x is detd. to be 0.2 .ltoreq. x .ltoreq. 0.2, and y is detd. to be y .ltoreq. 1.0) and at least either one of **lithium** cobalt oxide represented by a formula  $\text{Li}_{1+z}\text{CoO}_2$  (provided that z is detd. to be 0.5 .ltoreq. z .ltoreq. 0.5) or **lithium** nickel oxide represented by a formula  $\text{Li}_{1+z}\text{NiO}_2$  (provided that z is detd. to be 0.5 .ltoreq. z .ltoreq. 0.5), and wherein in the case that the wt. of spinel-type manganese oxide is defined as A and that the wt. of the **lithium** cobalt oxide or **lithium** nickel oxide is defined as B, the amt. of **lithium** cobalt oxide or **lithium** nickel oxide is detd. to be 0.05 .ltoreq.  $B/(A + B) < 0.2$ .

IT 24937-79-9, PvdF 25014-41-9, Polyacrylonitrile (spinel type oxide cathode for **nonaq. electrolyte battery** with **lithium intercalating** anode)

RN 24937-79-9 HCAPLUS

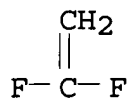
CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)



CM 1

CRN 75-38-7

CMF C2 H2 F2



RN 25014-41-9 HCAPLUS

CN 2-Propenenitrile, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 107-13-1

CMF C3 H3 N



IT 7440-31-5, Tin, uses 7440-66-6, Zinc, uses  
 (spinel type oxide cathode for **nonaq.**  
**electrolyte battery with lithium**  
**intercalating anode)**

RN 7440-31-5 HCAPLUS

CN Tin (8CI, 9CI) (CA INDEX NAME)

Sn

RN 7440-66-6 HCAPLUS

CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IC ICM H01M004-48

ICS H01M010-40; C01G045-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38

ST **lithium** manganese oxide cathode **battery**; cobalt  
**lithium** oxide cathode **battery**; nickel  
**lithium** oxide cathode **battery**

IT Secondary **batteries**

(**lithium**; spinel type oxide cathode for **nonaq**  
**electrolyte battery with lithium**  
**intercalating anode)**

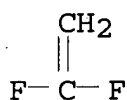
- IT Battery anodes  
Battery cathodes  
Polymer electrolytes  
(spinel type oxide cathode for nonaq.  
electrolyte battery with lithium  
intercalating anode)
- IT Fluoropolymers, uses  
Polycarbonates, uses  
Polyoxyalkylenes, uses  
(spinel type oxide cathode for nonaq.  
electrolyte battery with lithium  
intercalating anode)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate  
7791-03-9, Lithium perchlorate 14283-07-9,  
Lithium tetrafluoroborate 21324-40-3, Lithium  
hexafluorophosphate 24937-79-9, PvdF 25014-41-9,  
Polyacrylonitrile 25322-68-3, Polyethylene glycol 39300-70-4,  
Lithium nickel oxide 39457-42-6, Lithium  
manganese oxide 52627-24-4, Cobalt lithium oxide  
132843-44-8 144973-00-2, Cobalt lithium oxide  
CoLi0.5-1.5O2 272128-41-3, Lithium manganese oxide  
Li0.8-1.2Mn2O4 282725-14-8, Lithium nickel oxide  
(Li0.5-1.5NiO2)  
(spinel type oxide cathode for nonaq.  
electrolyte battery with lithium  
intercalating anode)
- IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-95-4,  
Magnesium, uses 7439-96-5, Manganese, uses 7439-98-7,  
Molybdenum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium,  
uses 7440-24-6, Strontium, uses 7440-31-5, Tin, uses  
7440-32-6, Titanium, uses 7440-47-3, Chromium, uses 7440-48-4,  
Cobalt, uses 7440-50-8, Copper, uses 7440-62-2, Vanadium, uses  
7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses  
7440-70-2, Calcium, uses  
(spinel type oxide cathode for nonaq.  
electrolyte battery with lithium  
intercalating anode)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L71 ANSWER 4 OF 6 HCAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2000:474471 HCAPLUS  
DOCUMENT NUMBER: 133:91975  
TITLE: Secondary nonaqueous  
electrolyte batteries using  
improved anodes  
INVENTOR(S): Akagi, Ryuichi; Suzuki, Atsushi  
PATENT ASSIGNEE(S): Kao Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.  
CODEN: JKXXAF

DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2000195520	A2	20000714	JP 1998-372734	19981228
AB	The <b>batteries</b> have cathodes contg. <b>Li+-intercalatable</b> active materials and anodes comprising sintered bodies (BET sp. surface area 1-100 m2/g) from Si (compd.) active materials, fired binders, and optional carbonaceous elec. conductors. The <b>batteries</b> show low irreversible capacity.				
IT	24937-79-9, Poly(vinylidene fluoride) (binder; secondary <b>nonaq. electrolyte Li batteries</b> using surface area-controlled sintered Si/C anodes for low irreversible capacity)				
RN	24937-79-9 HCAPLUS				
CN	Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)				
CM	1				
CRN	75-38-7				
CMF	C2 H2 F2				



IT 7440-21-3, Silicon, uses (secondary **nonaq. electrolyte Li batteries** using surface area-controlled sintered Si/C anodes for low irreversible capacity)  
 RN 7440-21-3 HCAPLUS  
 CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IC ICM H01M004-62  
 ICS H01M004-02; H01M004-38; H01M004-58  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST **nonaq electrolyte battery** silicon carbon anode; binder silicon sintered anode **lithium battery**  
 IT Fluoropolymers, uses (binder; secondary **nonaq. electrolyte Li batteries** using surface area-controlled sintered Si/C anodes for low irreversible capacity)

- IT Secondary **batteries**  
 (lithium; secondary **nonaq.**  
**electrolyte Li batteries** using  
 surface area-controlled sintered Si/C anodes for low irreversible  
 capacity)
- IT **Battery** anodes  
 Binders  
 Pitch  
 (secondary **nonaq. electrolyte Li**  
**batteries** using surface area-controlled sintered Si/C  
 anodes for low irreversible capacity)
- IT 282098-25-3, Graphiton  
 (Graphiton; secondary **nonaq. electrolyte**  
**Li batteries** using surface area-controlled  
 sintered Si/C anodes for low irreversible capacity)
- IT 24937-79-9, Poly(vinylidene fluoride)  
 (binder; secondary **nonaq. electrolyte**  
**Li batteries** using surface area-controlled  
 sintered Si/C anodes for low irreversible capacity)
- IT 7440-21-3, Silicon, uses 7782-42-5, Graphite, uses  
 282097-96-5, HSB-S  
 (secondary **nonaq. electrolyte Li**  
**batteries** using surface area-controlled sintered Si/C  
 anodes for low irreversible capacity)

L71 ANSWER 5 OF 6 HCAPLUS COPYRIGHT 2002 ACS  
 ACCESSION NUMBER: 2000:32661 HCAPLUS  
 DOCUMENT NUMBER: 132:66679  
 TITLE: Secondary **nonaqueous**  
**electrolyte batteries** and  
 their manufacture

INVENTOR(S): Suzuki, Ryuta  
 PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.  
 CODEN: JKXXAF

DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	JP 2000012091	A2	20000114	JP 1998-176261	19980623
AB	The <b>batteries</b> use <b>Li</b> contg. transition metal oxide cathodes and <b>Li intercalating</b> Si contg. compd. anodes, obtained by drying a dispersion of a Si compd. in a water free liq. applied on a collector.				
IT	7440-21-3, Silicon, uses 24937-79-9, Polyvinylidene fluoride ( <b>nonaq.</b> dispersion media in <b>lithium</b> <b>intercalating</b> silicon compd. anode manuf. for secondary <b>lithium batteries</b> )				

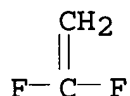
RN 7440-21-3 HCAPLUS  
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 24937-79-9 HCAPLUS  
CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 75-38-7  
CMF C2 H2 F2



IC ICM H01M010-40  
ICS H01M004-02; H01M004-04; H01M004-58; H01M004-62  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST secondary **lithium battery** silicon compd anode  
manuf  
IT **Battery** anodes  
(**nonaq.** dispersion media in **lithium**  
**intercalating** silicon compd. anode manuf. for secondary  
**lithium batteries**)  
IT Fluoropolymers, uses  
(**nonaq.** dispersion media in **lithium**  
**intercalating** silicon compd. anode manuf. for secondary  
**lithium batteries**)  
IT 7440-21-3, Silicon, uses 7631-86-9, Silica, uses  
24937-79-9, Polyvinylidene fluoride 193072-79-6  
(**nonaq.** dispersion media in **lithium**  
**intercalating** silicon compd. anode manuf. for secondary  
**lithium batteries**)  
IT 872-50-4, N-Methylpyrrolidone, uses  
(**nonaq.** dispersion media in **lithium**  
**intercalating** silicon compd. anode manuf. for secondary  
**lithium batteries**)

L71 ANSWER 6 OF 6 HCAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2000:32655 HCAPLUS

DOCUMENT NUMBER: 132:66676

TITLE: Secondary **nonaqueous**  
**electrolyte batteries**

INVENTOR(S): Mori, Nobufumi

PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.

DOCUMENT TYPE: CODEN: JKXXAF  
 LANGUAGE: Patent  
 FAMILY ACC. NUM. COUNT: 1 Japanese  
 PATENT INFORMATION:

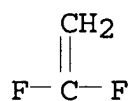
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2000012088	A2	20000114	JP 1998-171664	19980618
AB	The <b>batteries</b> use <b>Li</b> contg. transition metal oxide cathodes and <b>Li intercalating</b> Si compd. anodes, where the anode collectors are 5-100 .mu.m thick metal foils having av. surface roughness 0.03-1 .mu.m. The anode collectors are preferably Cu, Ni, Ti, their alloy, or stainless steel foils.				
IT	7440-21-3, Silicon, uses 24937-79-9, Polyvinylidene fluoride (metal foil collectors with controlled roughness for silicon compd. anodes in secondary <b>lithium batteries</b> )				
RN	7440-21-3 HCAPLUS				
CN	Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)				

Si

RN 24937-79-9 HCAPLUS  
 CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 75-38-7  
 CMF C2 H2 F2



IC ICM H01M010-40  
 ICS H01M004-02; H01M004-58; H01M004-64  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST **battery lithium intercalating** silicon compd anode collector; roughness metal collector **lithium** silicon compd anode  
 IT **Battery** anodes Surface roughness (metal foil collectors with controlled roughness for silicon compd. anodes in secondary **lithium batteries**)  
 IT Fluoropolymers, uses (metal foil collectors with controlled roughness for silicon compd. anodes in secondary **lithium batteries**)

IT 7440-21-3, Silicon, uses 7631-86-9, Silica, uses  
7782-42-5, Graphite, uses 24937-79-9, Polyvinylidene  
fluoride 193072-79-6  
(metal foil collectors with controlled roughness for silicon  
compd. anodes in secondary **lithium batteries**)

IT 7440-02-0, Nickel, uses 7440-32-6, Titanium, uses 7440-50-8,  
Copper, uses 11109-50-5, Sus 304  
(metal foil collectors with controlled roughness for silicon  
compd. anodes in secondary **lithium batteries**)

=> d l72 1-12 ti

L72 ANSWER 1 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI **Nonaqueous electrolyte batteries**

L72 ANSWER 2 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI **Battery with nonaqueous electrolyte**  
and improved anode active material

L72 ANSWER 3 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI **Secondary nonaqueous electrolyte**  
**batteries**

L72 ANSWER 4 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI **Nonaqueous electrolyte secondary battery**

L72 ANSWER 5 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI Anode-active material used in **lithium** secondary  
**battery**

L72 ANSWER 6 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI Process for producing **lithium** secondary **battery**

L72 ANSWER 7 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI **Non-aqueous electrolytic** secondary  
**battery** and manufacture of the **battery**

L72 ANSWER 8 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI Anode for **nonaqueous** secondary **battery**

L72 ANSWER 9 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI Anode for secondary **battery** with **nonaqueous**  
**electrolyte**

L72 ANSWER 10 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI A **lithium** halide additive for a **nonaqueous**  
**battery**

L72 ANSWER 11 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI Cell having mixed solid cathode materials for controlling cell  
expansion on discharge

L72 ANSWER 12 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
TI Metallic reducing additive for solid cathodes used in  
**nonaqueous batteries**

=> d 172 1-12 cbib abs hitstr hitind

L72 ANSWER 1 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
2001:778299 Document No. 135:333316 **Nonaqueous  
electrolyte batteries**. Okada, Mikio; Yasuda,  
Hideo (Japan Storage Battery Co., Ltd., Japan). Jpn. Kokai Tokkyo  
Koho JP 2001297792 A2 20011026, 7 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 2000-110416 20000412.  
AB The **batteries** have an **electrolyte** soln. contg.  
0.1 mM-0.1M F contg. ammonium salt complex and a polymer  
**electrolyte**. Preferably, the polymer **electrolyte**  
is attached to the anode.  
IT 7440-21-3, Silicon, uses 7440-31-5, Tin, uses  
(**electrolytes** contg. ammonium fluoride and carbon  
contg. polymers for secondary **lithium batteries**  
)  
RN 7440-21-3 HCAPLUS  
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 7440-31-5 HCAPLUS  
CN Tin (8CI, 9CI) (CA INDEX NAME)

Sn

IT 25014-41-9, PAN  
(**electrolytes** contg. ammonium fluoride and polymers for  
secondary **lithium batteries**)  
RN 25014-41-9 HCAPLUS  
CN 2-Propenenitrile, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 107-13-1  
CMF C3 H3 N

$\text{H}_2\text{C}=\text{CH}-\text{C}\equiv\text{N}$

IC ICM H01M010-40



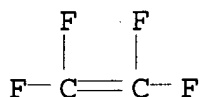
ICS H01M010-40  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST secondary **battery electrolyte** polymer ammonium  
fluoride  
IT **Battery electrolytes**  
(**electrolytes** contg. ammonium fluoride and polymers for  
secondary **lithium batteries**)  
IT 7429-90-5, Aluminum, uses 7440-21-3, Silicon, uses  
7440-31-5, Tin, uses 7782-42-5, Graphite, uses  
(**electrolytes** contg. ammonium fluoride and carbon  
contg. polymers for secondary **lithium batteries**  
)  
IT 96-49-1, Ethylene carbonate 110-71-4 7791-03-9, **Lithium**  
perchlorate 25014-41-9, PAN  
(**electrolytes** contg. ammonium fluoride and polymers for  
secondary **lithium batteries**)  
IT 145826-81-9  
(**electrolytes** contg. ammonium fluoride and polymers for  
secondary **lithium batteries**)  
  
L72 ANSWER 2 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
2001:691889 Document No. 135:229387 **Battery** with  
**nonaqueous electrolyte** and improved anode active  
material. Inagaki, Hiroki; Takami, Norio (Kabushiki Kaisha Toshiba,  
Japan). Eur. Pat. Appl. EP 1134824 A2 20010919, 12 pp. DESIGNATED  
STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,  
MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW.  
APPLICATION: EP 2001-302081 20010307. PRIORITY: JP 2000-72377  
20000315.  
AB The development of a new anode material led to the provision of a  
**battery with nonaq. electrolyte** which  
has a combination of a high discharge capacity with excellent  
cycling characteristics. The **battery with nonaq**  
**. electrolyte** comprises: a cathode and an anode having an  
anode active material capable of occluding and releasing an alkali  
metal. The anode active material contains .gtoreq.1 element  
selected from the group consisting of Group 4B elements and Group 5B  
elements and has .gtoreq.1 crystal structure selected from the group  
consisting of BiF3 structure, Cu2MnAl structure, and AgAsMg  
structure. The anode active material contains .gtoreq.1 element  
selected from the group consisting of Al, Si, Ge, Sn, P, Sb, and Bi  
and has .gtoreq.1 crystal structure selected from the group  
consisting of BiF3 structure, Cu2MnAl structure, and AgAsMg  
structure.  
IT 7440-21-3, Silicon, uses 7440-31-5, Tin, uses  
(**battery with nonaq. electrolyte**  
and improved anode active material)  
RN 7440-21-3 HCAPLUS  
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

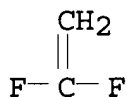
RN 7440-31-5 HCAPLUS  
 CN Tin (8CI, 9CI) (CA INDEX NAME)

Sn

IT 9002-84-0, Ptfе 24937-79-9, Pvdф  
 (binder; **battery with nonaq.**  
**electrolyte** and improved anode active material)  
 RN 9002-84-0 HCAPLUS  
 CN Ethene, tetrafluoro-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 116-14-3  
 CMF C2 F4



RN 24937-79-9 HCAPLUS  
 CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 75-38-7  
 CMF C2 H2 F2



IC ICM H01M004-38  
 ICS H01M004-46; H01M004-48; H01M004-58  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 56  
 ST anode **battery nonaq electrolyte**  
 IT **Battery anodes**  
 Secondary **batteries**  
 (**battery with nonaq. electrolyte**  
 and improved anode active material)  
 IT Alkali metals, uses

Group IVB elements

Group VB elements

(**battery** with **nonaq. electrolyte**  
and improved anode active material)

IT Carbon black, uses  
(**battery** with **nonaq. electrolyte**  
and improved anode active material)

IT Fluoro rubber  
Fluoropolymers, uses  
(binder; **battery** with **nonaq.**  
**electrolyte** and improved anode active material)

IT Synthetic rubber, uses  
(butadiene-ethylene, binder; **battery** with **nonaq.**  
**electrolyte** and improved anode active material)

IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate  
7429-90-5, Aluminum, uses 7440-21-3, Silicon, uses  
7440-31-5, Tin, uses 7440-36-0, Antimony, uses  
7440-56-4, Germanium, uses 7440-69-9, Bismuth, uses 7723-14-0,  
Phosphorus, uses 11056-42-1 11118-07-3 12003-42-8  
12023-54-0, Iron silicide (Fe<sub>3</sub>Si) 12032-71-2 12059-23-3  
12133-96-9 12163-59-6, Manganese silicide (Mn<sub>3</sub>Si) 12190-79-3,  
Cobalt **lithium** oxide colio<sub>2</sub> 12423-44-8 12502-69-1  
12526-54-4 12526-55-5 12534-03-1 21324-40-3, **Lithium**  
hexafluorophosphate 60968-66-3 66590-17-8 75349-09-6  
99787-36-7 105110-44-9 149571-46-0 149571-49-3 359783-12-3  
359783-13-4 359783-14-5 359783-15-6 359783-16-7 359783-17-8,  
Antimony manganese nickel phosphide (Sb<sub>0.8</sub>MnNi<sub>2</sub>P<sub>0.2</sub>) 359783-18-9,  
Antimony cobalt manganese phosphide (Sb<sub>0.8</sub>Co<sub>2</sub>MnP<sub>0.2</sub>) 359783-19-0  
359783-20-3 359783-21-4, Nickel tin titanium silicide  
(NiSn<sub>0.8</sub>TiSi<sub>0.2</sub>) 359783-22-5, Cobalt tin titanium silicide  
(CoSn<sub>0.8</sub>TiSi<sub>0.2</sub>) 359783-23-6 359783-24-7 359783-25-8  
359783-26-9

(**battery** with **nonaq. electrolyte**  
and improved anode active material)

IT 7782-42-5, Graphite, uses  
(**battery** with **nonaq. electrolyte**  
and improved anode active material)

IT 9002-84-0, Ptfе 9004-32-4, Cmc 24937-79-9, Pvdф  
(binder; **battery** with **nonaq.**  
**electrolyte** and improved anode active material)

L72 ANSWER 3 OF 12 HCAPLUS COPYRIGHT 2002 ACS

2001:636404 Document No. 135:183333 Secondary **nonaqueous**  
**electrolyte batteries**. Okada, Mikio; Yasuda,

Hideo (Japan Storage Battery Co., Ltd., Japan). PCT Int. Appl. WO  
2001063687 A1 20010830, 29 pp. DESIGNATED STATES: W: CN, JP, US;  
RW: DE, FR, GB. (Japanese). CODEN: PIXXD2. APPLICATION: WO  
2001-JP1249 20010221. PRIORITY: JP 2000-48344 20000224; JP  
2000-48348 20000224.

AB The **batteries** have a cathode, an anode, a **nonaq.**  
**electrolyte** soln., and a polymer membrane contg. Si, Sn,  
and/or Al particles or a porous polymer membrane contg. C, Si, Sn,

and/or Al particles between the electrodes. Preferably, the polymer membrane is **Li**+ conductive and in direct contact with the anode, and the anode is a **Li**, **Li** alloy, or carbonaceous anode.

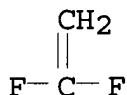
IT 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 24937-79-9, Poly(vinylidene fluoride) (polymer membranes contg. silicon and tin and aluminum and carbon particles for secondary **lithium batteries**)  
 RN 7440-21-3 HCAPLUS  
 CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 7440-31-5 HCAPLUS  
 CN Tin (8CI, 9CI) (CA INDEX NAME)

Sn

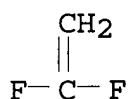
RN 24937-79-9 HCAPLUS  
 CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 75-38-7  
 CMF C2 H2 F2



IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary **lithium battery** inorg particle polymer membrane; silicon particle polymer membrane **lithium battery**; carbon particle polymer membrane **lithium battery**; tin particle polymer membrane **lithium battery**; aluminum particle polymer membrane **lithium battery**  
 IT Secondary **batteries** (**lithium**; polymer membranes contg. silicon and tin and aluminum and carbon particles for secondary **lithium batteries**)  
 IT Fluoropolymers, uses (polymer membranes contg. silicon and tin and aluminum and carbon particles for secondary **lithium batteries**)  
 IT 7429-90-5, Aluminum, uses 7440-21-3, Silicon, uses

7440-31-5, Tin, uses 7782-42-5, Graphite, uses  
 24937-79-9, Poly(vinylidene fluoride)  
 (polymer membranes contg. silicon and tin and aluminum and carbon  
 particles for secondary **lithium batteries**)

L72 ANSWER 4 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
 2001:114891 Document No. 134:134156 **Nonaqueous  
 electrolyte secondary battery.** Kohno, Tatsuoki;  
 Takami, Norio; Inagaki, Hiroki; Morita, Tomokazu; Takeno, Shirou  
 (Kabushiki Kaisha Toshiba, Japan). Eur. Pat. Appl. EP 1076373 A2  
 20010214, 25 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR,  
 GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO.  
 (English). CODEN: EPXXDW. APPLICATION: EP 2000-306779 20000809.  
 PRIORITY: JP 1999-225489 19990809; JP 1999-374989 19991228.  
 AB A **nonaq. electrolyte secondary battery**  
 comprises a **nonaq. electrolyte**, a pos.  
 electrode, and a neg. electrode contg. a neg. electrode active  
 material, wherein the neg. electrode active material contains a  
 composite material having a microstructure contg. a carbon-contg.  
 phase and a crystal phase having an av. size falling within a range  
 of between 0.01 .mu.m and 10 .mu.m.  
 IT 24937-79-9, PvdF  
 (binder; **nonaq. electrolyte secondary  
 battery**)  
 RN 24937-79-9 HCAPLUS  
 CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 75-38-7  
 CMF C2 H2 F2



IT 7440-21-3, Silicon, uses 7440-31-5, Tin, uses  
 7440-66-6, Zinc, uses  
 (**nonaq. electrolyte secondary battery**  
 )  
 RN 7440-21-3 HCAPLUS  
 CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

RN 7440-31-5 HCAPLUS  
 CN Tin (8CI, 9CI) (CA INDEX NAME)

Sn

RN 7440-66-6 HCAPLUS  
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IC ICM H01M010-40  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST **battery secondary nonaq electrolyte**  
IT Fluoropolymers, uses  
(binder; **nonaq. electrolyte secondary battery**)  
IT **Battery anodes**  
**Battery electrolytes**  
**Secondary batteries**  
(**nonaq. electrolyte secondary battery**)  
IT Carbon black, uses  
(**nonaq. electrolyte secondary battery**)  
IT 24937-79-9, PvdF  
(binder; **nonaq. electrolyte secondary battery**)  
IT 7440-50-8, Copper, uses  
(current collector; **nonaq. electrolyte secondary battery**)  
IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate  
7429-90-5, Aluminum, uses 7439-91-0, Lanthanum, uses 7439-92-1,  
Lead, uses 7439-95-4, Magnesium, uses 7439-98-7, Molybdenum,  
uses 7440-00-8, Neodymium, uses 7440-03-1, Niobium, uses  
**7440-21-3**, Silicon, uses 7440-24-6, Strontium, uses  
7440-25-7, Tantalum, uses **7440-31-5**, Tin, uses  
7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0,  
Antimony, uses 7440-39-3, Barium, uses 7440-42-8, Boron, uses  
7440-44-0, Carbon, uses 7440-45-1, Cerium, uses 7440-47-3,  
Chromium, uses 7440-55-3, Gallium, uses 7440-56-4, Germanium,  
uses 7440-62-2, Vanadium, uses **7440-66-6**, Zinc, uses  
7440-67-7, Zirconium, uses 7440-70-2, Calcium, uses 7440-74-6,  
Indium, uses 9002-88-4, Polyethylene 12190-79-3, Cobalt  
**lithium oxide colio2 21324-40-3, Lithium**  
**hexafluorophosphate**  
(**nonaq. electrolyte secondary battery**)  
IT 7782-42-5, Graphite, uses  
(**nonaq. electrolyte secondary battery**)  
IT 872-50-4, n-Methylpyrrolidone, uses

(nonaq. electrolyte secondary battery  
)

L72 ANSWER 5 OF 12 HCAPLUS COPYRIGHT 2002 ACS

2000:608507 Document No. 133:196015 Anode-active material used in  
lithium secondary battery. Kaneda, Junya;  
Takeuchi, Seiji; Watanabe, Noriyuki; Yamaki, Takahiro; Muranaka,  
Yasushi; Aono, Yasuhisa (Hitachi, Ltd., Japan). Eur. Pat. Appl. EP  
1032062 A1 20000830, 32 pp. DESIGNATED STATES: R: AT, BE, CH, DE,  
DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI,  
RO. (English). CODEN: EPXXDW. APPLICATION: EP 2000-102256  
20000215. PRIORITY: JP 1999-44119 19990223.

AB A lithium secondary battery comprising a pos.  
electrode, a neg. electrode contg. a lithium  
ion-storable/dischargeable neg. electrode-active material and a  
lithium ion conductive, nonaq.  
electrolytic soln. or polymer electrolyte, is  
characterized in that the neg. electrode-active material comprises  
particles of carbonaceous material and particles of metal and metal  
oxide capable of enhancing lithium ion interstitial  
diffusibility/releasability as embedded in the particles of  
carbonaceous material. The particles of carbonaceous materials and  
lithium ion interstitially diffusible/releasable particles  
are prepd. by carbonization of a mixt. thereof with MA or carbon  
precursor. The battery has a high capacity and a long  
cycle life, and can be used in various elec. appliances.

IT 7440-21-3, Silicon, uses  
(anode-active material used in lithium secondary  
battery)

RN 7440-21-3 HCAPLUS

CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IT 24937-79-9, PvdF  
(anode-active material used in lithium secondary  
battery)

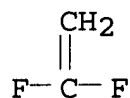
RN 24937-79-9 HCAPLUS

CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 75-38-7

CMF C2 H2 F2



IC ICM H01M004-58  
ICS H01M010-40; C01G031-00  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST **lithium battery** anode active material  
IT **Battery** anodes  
Carbonization  
Petroleum pitch  
(anode-active material used in **lithium** secondary  
**battery**)  
IT Carbon fibers, uses  
Carbonaceous materials (technological products)  
(anode-active material used in **lithium** secondary  
**battery**)  
IT Fluoropolymers, uses  
(anode-active material used in **lithium** secondary  
**battery**)  
IT Secondary **batteries**  
(**lithium**; anode-active material used in **lithium**  
secondary **battery**)  
IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate  
7429-90-5, Aluminum, uses **7440-21-3**, Silicon, uses  
7440-56-4, Germanium, uses 7782-42-5, Graphite, uses 12057-17-9,  
**Lithium** manganese oxide  $\text{LiMn}_2\text{O}_4$  12190-79-3, Cobalt  
**lithium** oxide  $\text{CoLiO}_2$  15773-66-7, Tin silicate  $\text{SnSiO}_3$   
18282-10-5, Tin dioxide 21324-40-3, **Lithium**  
hexafluorophosphate 113066-89-0, Cobalt **lithium** nickel  
oxide  $\text{Co}_0.2\text{LiNi}_0.8\text{O}_2$  113443-18-8, Silicon oxide ( $\text{SiO}$ )  
178404-39-2, **Lithium** manganese oxide  $\text{Li}_{1.09}\text{Mn}_{1.91}\text{O}_4$   
(anode-active material used in **lithium** secondary  
**battery**)  
IT 24937-79-9, PvdF  
(anode-active material used in **lithium** secondary  
**battery**)  
IT 7440-50-8, Copper, uses  
(current collector; anode-active material used in **lithium**  
secondary **battery**)  
  
L72 ANSWER 6 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
2000:493254 Document No. 133:107408 Process for producing  
**lithium** secondary **battery**. Kaneda, Junya;  
Watanabe, Noriyuki; Aono, Yasuhisa; Takeuchi, Seiji; Muranaka,  
Yasushi; Takei, Kouichi (Hitachi, Ltd., Japan; Hitachi Chemical  
Company, Ltd.). Eur. Pat. Appl. EP 1020944 A2 20000719, 25 pp.  
DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI,  
LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN:  
EPXXDW. APPLICATION: EP 2000-100127 20000107. PRIORITY: JP  
1999-7380 19990114.  
AB A **lithium** secondary **battery**, which comprises a  
pos. electrode, a neg. electrode contg. a **lithium**  
ion-storable/dischargeable neg. electrode-active material and a  
**lithium** ion conductive, **nonaq.**



**electrolytic** soln. or polymer **electrolyte** can have distinguished charging/discharging characteristics and a higher safety, when the neg. electrode material contains particles comprising carbonaceous materials and at least one of elements capable of forming a compd. with **Li**; the elements have a m.p. of at least 900.degree. and a thermal expansion coeff. of not more than 9 ppm/K at room temp.; the particles are embedded in a plurality of layers of the carbonaceous materials; the particles being subjected to a mech. treatment to make particle sizes of the particles smaller than the initial particle size in advance.

IT 7440-21-3, Silicon, uses  
(process for producing **lithium** secondary battery)

RN 7440-21-3 HCAPLUS

CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IT 24937-79-9, PvdF  
(process for producing **lithium** secondary battery)

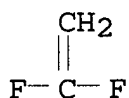
RN 24937-79-9 HCAPLUS

CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 75-38-7

CMF C2 H2 F2



IC ICM H01M010-40

ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **lithium battery** fabrication; safety

**lithium battery**

IT Secondary batteries

(**lithium**; process for producing **lithium** secondary battery)

IT Battery anodes

Coal tar pitch

Petroleum pitch

(process for producing **lithium** secondary battery)

IT Carbonaceous materials (technological products)

(process for producing **lithium** secondary

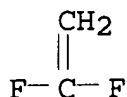
**battery)**

- IT Fluoropolymers, uses  
(process for producing **lithium** secondary  
**battery)**
- IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate  
616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate  
7429-90-5, Aluminum, uses 7440-44-0, Carbon, uses 7782-42-5,  
Graphite, uses 12057-17-9, **Lithium** manganese oxide  
limn2o4 12190-79-3, Cobalt **lithium** oxide colio2  
14283-07-9, **Lithium** tetrafluoroborate 21324-40-3,  
**Lithium** hexafluorophosphate 99637-69-1, **Lithium**  
nickel oxide lini2o4  
(process for producing **lithium** secondary  
**battery)**
- IT 7440-21-3, Silicon, uses 7440-56-4, Germanium, uses  
(process for producing **lithium** secondary  
**battery)**
- IT 7440-50-8, Copper, uses 24937-79-9, PvdF  
(process for producing **lithium** secondary  
**battery)**
- L72 ANSWER 7 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
2000:34357 Document No. 132:66687 **Non-aqueous**  
**electrolytic** secondary **battery** and manufacture of  
the **battery**. Suzuki, Ryuta (Fuji Photo Film Co., Ltd.,  
Japan). Jpn. Kokai Tokkyo Koho JP 2000011997 A2 20000114, 14 pp.  
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-173378 19980619.
- AB The **non-aq. electrolytic** secondary  
**battery** comprises a cathode contg. a **Li**-transition  
metal oxide type active mass and an anode which contains a Si-contg.  
compd. capable of absorbing and discharging **Li** and is  
produced by dispersing and kneading the Si-contg. compd. in the  
presence of water, applying the resultant paste to a collector, and  
drying the collector. The **battery** has a high energy d.  
and a long cycle life.
- IT 24937-79-9, Poly(vinylidene fluoride)  
(binder, anode active mass contg.; **non-aq.**  
**electrolytic** secondary **battery** comprising anode  
contg. silicon compd. capable of absorbing and desorbing  
**lithium** for high energy d. and long cycle life)
- RN 24937-79-9 HCAPLUS
- CN Ethene, 1,1-difluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 75-38-7

CMF C2 H2 F2



- IT 7440-21-3, Silicon, uses  
(polycrystal; **non-aq. electrolytic**  
secondary **battery** comprising anode contg. silicon  
compd. capable of absorbing and desorbing **lithium** for  
high energy d. and long cycle life)
- RN 7440-21-3 HCAPLUS
- CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)
- Si
- IC ICM H01M004-02  
ICS H01M004-04; H01M004-58; H01M004-62; H01M010-40
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST **battery** silicon compd anode active mass
- IT Fluoropolymers, uses  
Styrene-butadiene rubber, uses  
(binder, anode active mass contg.; **non-aq.**  
**electrolytic** secondary **battery** comprising anode  
contg. silicon compd. capable of absorbing and desorbing  
**lithium** for high energy d. and long cycle life)
- IT Secondary **batteries**  
(**lithium**; **non-aq.**  
**electrolytic** secondary **battery** comprising anode  
contg. silicon compd. capable of absorbing and desorbing  
**lithium** for high energy d. and long cycle life)
- IT **Battery** anodes  
(**non-aq. electrolytic** secondary  
**battery** comprising anode contg. silicon compd. capable of  
absorbing and desorbing **lithium** for high energy d. and  
long cycle life)
- IT 7782-42-5, Graphite, uses  
(anode active mass contg. silicon compd. and; **non-**  
**aq. electrolytic** secondary **battery**  
comprising anode contg. silicon compd. capable of absorbing and  
desorbing **lithium** for high energy d. and long cycle  
life)
- IT 24937-79-9, Poly(vinylidene fluoride)  
(binder, anode active mass contg.; **non-aq.**  
**electrolytic** secondary **battery** comprising anode  
contg. silicon compd. capable of absorbing and desorbing  
**lithium** for high energy d. and long cycle life)
- IT 12190-79-3, Cobalt **lithium** oxide (CoLiO<sub>2</sub>)  
(cathode active mass; **non-aq.**  
**electrolytic** secondary **battery** comprising anode

- contg. silicon compd. capable of absorbing and desorbing **lithium** for high energy d. and long cycle life)
- IT 7631-86-9, Silica, uses  
(mixt. with silicon; **non-aq. electrolytic** secondary **battery** comprising anode contg. silicon compd. capable of absorbing and desorbing **lithium** for high energy d. and long cycle life)
- IT 63784-76-9, **Lithium** silicide ( $\text{Li}_4\text{Si}$ )  
(**non-aq. electrolytic** secondary **battery** comprising anode contg. silicon compd. capable of absorbing and desorbing **lithium** for high energy d. and long cycle life)
- IT 193072-79-6  
(**non-aq. electrolytic** secondary **battery** comprising anode contg. silicon compd. capable of absorbing and desorbing **lithium** for high energy d. and long cycle life)
- IT 7440-21-3, Silicon, uses  
(polycrystal; **non-aq. electrolytic** secondary **battery** comprising anode contg. silicon compd. capable of absorbing and desorbing **lithium** for high energy d. and long cycle life)
- IT 7440-02-0, Nickel, uses  
(silicon coated with; **non-aq. electrolytic** secondary **battery** comprising anode contg. silicon compd. capable of absorbing and desorbing **lithium** for high energy d. and long cycle life)
- IT 9003-55-8  
(styrene-butadiene rubber, binder, anode active mass contg.; **non-aq. electrolytic** secondary **battery** comprising anode contg. silicon compd. capable of absorbing and desorbing **lithium** for high energy d. and long cycle life)
- L72 ANSWER 8 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
1986:12273 Document No. 104:12273 Anode for **nonaqueous** secondary **battery**. (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 60124357 A2 19850703 Showa, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1983-231736 19831208.
- AB The anode mainly consists of powd. metal or alloy that reversibly absorbs alkali metal ions and PTFE resin, and is added with metal powder inert to **Li**. Typically the alkali metal is **Li**, and the anode material is selected from **Sn**, Al, Mg, Pb and In, or from alloys of **Sn**, Bi, Pb, Cd, In, Sb, Zn, and Ag. The inert metal may be selected from Ni, Fe, Cu, and Co. The anode material provides high energy d., charge-discharge property, and reliability. Thus, a mixt. of Sn powder 80, Ni powder 15, and PTFE powder 5 parts was kneaded and pressed into 0.2 mm sheet. Cutout pieces of the sheet were pressed and welded on a Ni support to form the anode. **Li** was absorbed by **electrolysis** in 1M  $\text{LiClO}_4$  in propylene carbonate. A button **battery** using

a C fluoride cathode, the anode, and the same **electrolyte** showed much lowered internal resistance during the entire discharge period, and the capacity did not decrease by the addn. of Ni powder.

IT 7440-31-5, uses and miscellaneous  
(anode, **lithium**-contg., for **nonaq.** secondary  
**battery**)

RN 7440-31-5 HCAPLUS

CN Tin (8CI, 9CI) (CA INDEX NAME)

Sn

IT 7439-93-2, uses and miscellaneous  
(anodes, from metal or alloys contg., for **nonaq.**  
secondary **battery**)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 9002-84-0  
(resin, **nonaq.** secondary **battery** anode  
contg.)

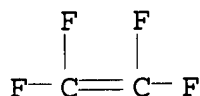
RN 9002-84-0 HCAPLUS

CN Ethene, tetrafluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 116-14-3

CMF C2 F4



IC ICM H01M004-62

CC 72-3 (Electrochemistry)

ST **lithium** secondary **battery** anode compn; anode  
**lithium** metal powder additive; fluoro-resin additive anode  
**lithium battery**

IT **Batteries**, secondary  
(**nonaq.**, **lithium**-contg. metal and alloy  
anodes for)

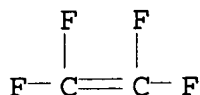
IT Anodes  
(**battery**, **lithium**-contg. metal and alloys,  
**nonaq.**)

IT Antimony alloy, base

Bismuth alloy, base  
 Cadmium alloy, base  
 Indium alloy, base  
 Lead alloy, base  
 Silver alloy, base  
 Tin alloy, base  
 Zinc alloy, base  
 (anode, **lithium**-contg., for **nonaq.** secondary  
**battery**)  
 IT **Lithium** alloy, nonbase  
 (anodes, from metal or alloys contg., for **nonaq.**  
 secondary **battery**)  
 IT 7429-90-5, uses and miscellaneous 7439-89-6, uses and  
 miscellaneous 7439-92-1, uses and miscellaneous 7439-95-4, uses  
 and miscellaneous 7440-02-0, uses and miscellaneous  
**7440-31-5**, uses and miscellaneous 7440-48-4, uses and  
 miscellaneous 7440-50-8, uses and miscellaneous 7440-74-6, uses  
 and miscellaneous  
 (anode, **lithium**-contg., for **nonaq.** secondary  
**battery**)  
 IT **7439-93-2**, uses and miscellaneous  
 (anodes, from metal or alloys contg., for **nonaq.**  
 secondary **battery**)  
 IT **9002-84-0**  
 (resin, **nonaq.** secondary **battery** anode  
 contg.)  
  
 L72 ANSWER 9 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
 1985:618285 Document No. 103:218285 Anode for secondary  
**battery** with **nonaqueous electrolyte**.  
 (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai  
 Tokkyo Koho JP 60124369 A2 19850703 Showa, 4 pp. (Japanese).  
 CODEN: JKXXAF. APPLICATION: JP 1983-231735 19831208.  
 AB The title anode is prepd. by sandwiching a Ni grid between 2 films  
 of alkali metal ion-occluding metal or alloy powder and PTFE [  
**9002-84-0**]. Thus, an anode was prepd. by mixing 5 wt.% Sn  
 powder and PTFE powder, pressing the mixt. between rollers to form  
 2-mm-thick films, placing an expanded Ni grid between 2 films, and  
 by rolling the combination. A **battery** contg. this anode,  
 a **Li** cathode, glass-filter separator, and M LiClO<sub>4</sub> in  
 propylene carbonate **electrolyte** had on charging and  
 discharging a better discharge capacity than a **battery**  
 contg. a Ni grid sandwiched between 2 PTFE films.  
 IT **7440-31-5**, uses and miscellaneous  
 (anodes contg., PTFE, for **batteries**)  
 RN 7440-31-5 HCAPLUS  
 CN Tin (8CI, 9CI) (CA INDEX NAME)

Sn

IT 9002-84-0  
 (anodes, contg. tin, for **batteries**)  
 RN 9002-84-0 HCAPLUS  
 CN Ethene, tetrafluoro-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 116-14-3  
 CMF C2 F4



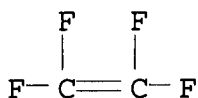
IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST tin **lithium nonaq electrolyte**  
**battery**; anode **battery** tin PTFE  
 IT **Batteries**, secondary  
 (lithium-tin, of high discharge capacity)  
 IT Anodes  
 (battery, PTFE, contg. tin)  
 IT 7440-31-5, uses and miscellaneous  
 (anodes contg., PTFE, for **batteries**)  
 IT 9002-84-0  
 (anodes, contg. tin, for **batteries**)  
 L72 ANSWER 10 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
 1984:164300 Document No. 100:164300 A **lithium** halide  
 additive for a **nonaqueous battery**. (Union  
 Carbide Corp., USA). Jpn. Kokai Tokkyo Koho JP 59005570 A2 19840112  
 Showa, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP  
 1983-105636 19830613. PRIORITY: US 1982-388478 19820614.  
 AB A **Li** halide(s) such as LiCl, LiF, LiBr, and/or LiI is  
 added to the **electrolyte** of a **nonaq.**  
**battery** consisting of a **Li** anode, liq. org.  
**electrolyte**, and FeS<sub>2</sub> or MnO<sub>2</sub> cathode to improve the voltage  
 level in pulse discharging. Optionally, an FeS<sub>2</sub> cathode contg. CuO,  
 Bi<sub>2</sub>O<sub>3</sub>, Pb<sub>2</sub>Bi<sub>2</sub>O<sub>5</sub>, Pb<sub>3</sub>O<sub>4</sub>, and/or CoS<sub>2</sub> may be used. Addnl., the  
 cathode may contain a conductor and binder.  
 IT 7439-93-2, uses and miscellaneous  
 (battery, **nonaq.**, **lithium** halide  
 additive for **electrolyte** for)  
 RN 7439-93-2 HCAPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7440-66-6, uses and miscellaneous 9002-84-0  
 (cathode contg., in nonaq. battery)  
 RN 7440-66-6 HCAPLUS  
 CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

RN 9002-84-0 HCAPLUS  
 CN Ethene, tetrafluoro-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 116-14-3  
 CMF C2 F4



IC H01M006-16  
 CC 72-3 (Electrochemistry)  
 ST lithium halide additive nonaq battery;  
 chloride lithium additive nonaq battery  
 ; fluoride lithium additive nonaq  
 battery; bromide lithium additive nonaq  
 battery; iodide lithium additive nonaq  
 battery; iron sulfide cathode nonaq  
 battery; manganese oxide cathode nonaq  
 battery  
 IT Lithium halides  
 (additive, for electrolyte of lithium  
 nonaq. battery)  
 IT Carbon black, uses and miscellaneous  
 (cathode contg., in nonaq. battery)  
 IT Batteries, primary  
 (nonaq., lithium halide additive for  
 electrolytes on)  
 IT 7447-41-8, uses and miscellaneous 7550-35-8 7789-24-4, uses and  
 miscellaneous  
 (additive, for electrolyte of lithium  
 nonaq. battery)  
 IT 10377-51-2  
 (additive, for electrolyte of lithium  
 nonaq. battery)  
 IT 7439-93-2, uses and miscellaneous  
 (battery, nonaq., lithium halide  
 additive for electrolyte for)  
 IT 7440-66-6, uses and miscellaneous 9002-84-0



(cathode contg., in **nonaq. battery**)  
IT 1313-13-9, uses and miscellaneous  
(cathode, in **lithium nonaq. battery**  
with **electrolyte** contg. **lithium** halides)  
IT 12068-85-8  
(cathode, with and without additives, in **lithium**  
**nonaq. battery**)  
IT 33454-82-9  
(**electrolyte** contg., in **nonaq.**  
**battery**)  
IT 1304-76-3, uses and miscellaneous  
(iron disulfide cathode contg. for **lithium**  
**nonaq. battery**)  
IT 1314-41-6 1317-38-0, uses and miscellaneous 12013-10-4  
12356-42-2  
(iron disulfide cathode contg. for **lithium**  
**nonaq. battery**)

L72 ANSWER 11 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
1983:169332 Document No. 98:169332 Cell having mixed solid cathode  
materials for controlling cell expansion on discharge. Bubnick,  
Gerald Frank (Union Carbide Corp. , USA). Eur. Pat. Appl. EP 68230  
A1 19830105, 18 pp. DESIGNATED STATES: R: BE, CH, DE, FR, GB, LI.  
(English). CODEN: EPXXDW. APPLICATION: EP 1982-105118 19820611.  
PRIORITY: US 1981-278903 19810629.

AB A **battery** with a substantially const. phys. configuration  
during discharge was made from a cathode mix having a volumetric  
expansion practically equal to the volumetric contraction of the  
anode. Thus, a button-type cell was made with a **Li** anode  
disk and a bonded cathode mix of CuO and FeS<sub>2</sub> in a **nonaq.**  
**electrolyte** of dimethoxyethane 30, 3-methyl-2-oxazolidone  
and 1,3-dioxolane 40% contg. 1M LiCF<sub>3</sub>SO<sub>3</sub>. A separator was placed  
between the anode and cathode, and a nylon gasket insulated the  
cover from the container.

IT 7439-93-2, uses and miscellaneous  
(anodes, **battery**)  
RN 7439-93-2 HCAPLUS  
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

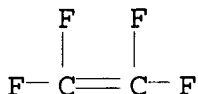
IT 7440-66-6, uses and miscellaneous 9002-84-0  
(cathodes contg., for **lithium battery**)  
RN 7440-66-6 HCAPLUS  
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

RN 9002-84-0 HCAPLUS  
 CN Ethene, tetrafluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 116-14-3  
 CMF C2 F4



- IC H01M004-36; H01M006-50  
 CC 72-3 (Electrochemistry)  
 ST **battery lithium org electrolyte**,  
 cupric oxide cathode **lithium battery**; iron  
 sulfide cathode **lithium battery**  
 IT Carbon black, uses and miscellaneous  
 (cathodes contg., for **lithium battery**)  
 IT **Batteries**, primary  
 (**lithium**, solid cathode materials for)  
 IT 7439-93-2, uses and miscellaneous  
 (anodes, **battery**)  
 IT 1317-38-0, uses and miscellaneous 7440-66-6, uses and  
 miscellaneous 9002-84-0 12068-85-8  
 (cathodes contg., for **lithium battery**)
- L72 ANSWER 12 OF 12 HCAPLUS COPYRIGHT 2002 ACS  
 1979:514496 Document No. 91:114496 Metallic reducing additive for  
 solid cathodes used in **nonaqueous batteries**.  
 Kronenberg, Marvin Lee (Union Carbide Corp., USA). Ger. Offen. DE  
 2848962 19790531, 24 pp. (German). CODEN: GWXXBX. APPLICATION: DE  
 1978-2848962 19781111.
- AB In a **nonaq. battery** for transistorized devices,  
 the cathode contains a larger amt. of graphite and/or C and a  
 smaller amt. of a metallic reducing agent (incorporated throughout  
 the cathode) which is sufficient to reduce any materials in the  
**battery** which are more cathodic than the active cathode  
 material, and of course with respect to the anode. The metallic  
 reducing agent is a discrete material which is in elec. and ionic  
 contact with the cathode and is selected from Zn (preferably), V,  
 Mn, Cr, Fe, Cd, In, Sn, Pb, Zr, Ti, **Li**, Na, K, Mg, Al, and  
 Ca. The active cathode material is chosen from CFx, V2O5, WO3,  
 MoO3, Pb oxide, Co oxide, MnO2, Cu oxide, CuS, CoS2, In sulfide, Fe  
 sulfide, NiS, Ag2CrO4, Ag3PO4, and CuSO4. The anode is chosen from  
**Li**, Na, K, Ca, Mg and their alloys. The **electrolyte**  
 is an org. solvent or mixt. of org. solvents. For example, a planar  
**battery**, with a metal cap for closure, contains a  
 disk-shaped **Li** anode, an FeS2 cathode and  
**electrolyte** of LiCF3SO3 soln. in dioxolane 40,

dimethoxyethane 30, and 3-methyl-2-oxazolidone 30% with a trace of dimethylisoxazole. The cathode collector consists of a Ni grid and the separator of nonwoven polypropylene. In the case of a drain of 1.2 mA, the **battery** showed a voltage of 1.8 V. Within 15 min, the outlet voltage fell to .apprx.1.4 V and stayed there upon further discharge. The addn. of Zn powder (as reducing agent) and C black to the FeS<sub>2</sub> improved the qualities of the **battery**.

IT 7439-93-2, uses and miscellaneous  
(anode, for **nonaq. battery**)  
RN 7439-93-2 HCAPLUS  
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

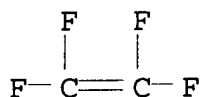
Li

IT 9002-84-0  
(binder, in primary **nonaq. battery**)  
RN 9002-84-0 HCAPLUS  
CN Ethene, tetrafluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 116-14-3

CMF C2 F4



IT 7440-31-5, uses and miscellaneous  
(reducing additive, for primary **nonaq. battery**)  
RN 7440-31-5 HCAPLUS  
CN Tin (8CI, 9CI) (CA INDEX NAME)

Sn

IT 7440-66-6, uses and miscellaneous  
(reducing agent, for solid cathode in primary **nonaq. battery**)  
RN 7440-66-6 HCAPLUS  
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IC H01M004-62; H01M004-58; H01M006-16  
CC 72-2 (Electrochemistry)  
ST **battery** primary metal reducing agent; zinc reducing agent  
primary **battery**; cathode reducing agent primary  
**battery**  
IT Carbon black, uses and miscellaneous  
(in primary **nonaq. battery** with metal  
reducing additive)  
IT Reducing agents  
(metals, for cathodes in primary **nonaq.**  
**batteries**)  
IT **Batteries**, primary  
(**nonaq.**, for transistorized devices, metallic reducing  
additive for use in)  
IT Cathodes  
(**battery**, metal reducing additives for, in  
**nonaq. electrolytes**)  
IT 7439-93-2, uses and miscellaneous  
(anode, for **nonaq. battery**)  
IT 9002-84-0  
(binder, in primary **nonaq. battery**)  
IT 7440-02-0, uses and miscellaneous  
(cathode collector, for primary **nonaq. battery**  
)  
IT 1317-38-0, uses and miscellaneous  
(cathode, for primary **nonaq. battery**)  
IT 12068-85-8  
(cathode, with metal reducing additive, for **nonaq.**  
**battery**)  
IT 33454-82-9  
(**electrolyte**, for primary **battery**)  
IT 110-71-4 300-87-8 646-06-0 19836-78-3  
(in primary **nonaq. battery**)  
IT 7440-44-0, uses and miscellaneous 7782-42-5, uses and  
miscellaneous  
(in primary **nonaq. battery**, with metal  
reducing additive)  
IT 7439-89-6, uses and miscellaneous 7440-31-5, uses and  
miscellaneous  
(reducing additive, for primary **nonaq. battery**  
)  
IT 7440-66-6, uses and miscellaneous  
(reducing agent, for solid cathode in primary **nonaq.**  
**battery**)  
IT 9003-07-0  
(separator, for primary **nonaq. battery**)  
IT 12597-69-2, uses and miscellaneous  
(wool, in primary **nonaq. battery**)